

Interactive comment on “Magnitude correlations in a self-similar aftershock rates model of seismicity” by Andres F. Zambrano Moreno and Jörn Davidsen

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The paper presents an analysis of the magnitude correlations in the earlier proposed self-similar aftershock rates (SSAR) model by Davidsen and Baiesi,(2016). The paper is well structured and written. It provides a detailed and rigorous analysis of magnitude correlations in the SSAR model. I think it represents an important contribution to the studies of marked point processes. Therefore, I think the paper should be considered for publication in Nonlinear Processes in Geophysics provided the authors address several my concerns.

- I think the authors should mention and cite two references, where the scaling for

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aftershock rates was recognised earlier than what is given in Davidsen and Baiesi (2016). Specifically this was done in the following works:

1. R. Shcherbakov, D.L. Turcotte, and J.B. Rundle, "A generalized Omori's law for earthquake aftershock decay", *Geophys. Res. Lett.*, 31 (2004) L11613, doi:10.1029/2004GL019808.
2. R. Shcherbakov, D.L. Turcotte, and J.B. Rundle, "Complexity and Earthquakes" in *Treatise on Geophysics*, 2nd ed., Vol. 4, Ch. 24, ed. H. Kanamori, Elsevier, 2015, doi:10.1016/B978-0-444-53802-4.00094-4.

Specifically, in Shcherbakov et al. (2015) the scaling relationships given in Eq. (3) was introduced and the corresponding relationship between exponents was also given. In addition, the variability of the b-value during different stages of aftershock sequences was also recognised in Shcherbakov et al. (2004).

- Page 5. Lines 30-35. I think the reference to the Southern California catalogue to explain the absence of correlations in synthetic data is not clear. The synthetic catalogue should not be affected by the incompleteness issue assuming that the simulations were performed properly. So this indicates that correlations diminish with increasing lower magnitude cutoff m_{th} . Any explanation for this effect?

- Page 4 Lines 15-24. What are the β and β_{as} values used in the simulations to generate the synthetic earthquake catalogue? How the difference between these two values affects the "trivial correlations" between magnitudes?

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